NOAA Teacher at Sea
Dennis Starkey
Onboard NOAA Ship MILLER FREEMAN
June 15 – August 4, 2006

NOAA Teacher at Sea: Denny Starkey
Aboard the: MILLER FREEMAN
Pollack Studies in the Bering Sea
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"Way Out There!"

Science and Technology Log
We are now 529 nautical miles out into the Bering Sea. I thought there would be an occasional sea bird of some kind. I was mistaken. There are tons of sea birds to see! The U.S. Fish and Wildlife Service is also conducting a survey of the density of bird life in the Bering Sea. Tamara, our bird Biologist, spends daily shifts on the Captain's deck recording the birds that she sees in a 300-foot swath in front of the ship's path. She has been busy. She enters the species and numbers of birds on a computer program that works in conjunction with the ship's radar. Some of the common species are, Northern Fulmars, Murres, Kittiwakes, and my favorite, Puffins. The results give an impression of the density, or how many of each kind in a specific section, for the Bering Sea area. Tamara informed me that the last survey of this kind was in the 1980's. The weather looks calm and "beautiful sailing" conditions prevail. There is a stratus cloud cover, but the sun has peeked out on occasion. The temperature is currently 8 degrees Celsius. The overall temperature range has been a bit warmer than this and has been comfortable to dress in a sweatshirt.

"How Do You Know There Are Fish Down There?"
You see, we are not catching tons of fish. We do this on purpose. In the past, fishermen would report catch amounts and that information would be analyzed and that was about all. This left speculation as to many variables that were not consistent. Reports were not always accurate, locations were not disclosed, and weights weren't reliable. By having a research vessel conduct the survey, the results can have reliability and consistency measures.

To go out into the Bering Sea and drag nets all over the place does not make economic sense. A better solution is to find traditional fishery areas in the Bering Sea and survey those areas. Those areas happen to be along the continental shelf. This is a comparatively shallow area of the ocean where currents of warmer and cooler water converge and circulate, allowing ideal conditions for life to flourish. This is an area rich in phytoplankton (plants or algae) that are producers of food, which can feed lower end primary consumers (krill), that feed secondary and tertiary consumers and so on. The Pollock find this area a favorable habitat for this reason.

So, you can't catch them all, especially with one or two boats, so what do you do? Use technology! The computers, program software, and technology devices used make the survey possible. Echo sound is proving to be a fantastic way to find and quantify data.

Consider this scenario: It works sort of like this: You are in your bedroom reading when you hear a truck outside. You think, "It's a big truck," based on the type of sound and your experience listening to sounds. You knew it was a truck even though you never saw it. In order to confirm what you were hearing was a truck, you tell your mother to look out the window and let you know if it is a truck. She might yell back, "It's a fire truck at the neighbor's house next door!" After she physically sees it, she can provide you with the details by providing color, length, and function of the truck. The echo-scientists can't exactly see each individual fish as we go by at 12 knots, but what they can do is be reasonably sure that different sound frequencies bounce back to the sonar equipment in a predictable fashion based on species. I'm informed that the fish's swim bladders are the telltale sign. They do see a mass of colors and bunches on the computer monitor, but you can't measure that information yet until confirmed. Even jellyfish have their own particular patterns as do krill, and whales for that matter. The next step is to have a system to indeed find out for sure that the fish are there.

This is the part where mom is your eyewitness. Fisheries scientists then return to the site by using satellite technology to where the characteristic patterns are detected. Then a trawl net is lowered and dragged. What is caught is recorded. My experience here in four trawls has shown 100% accuracy each time! We take the collected specimens and put them on a 10ft x12ft x10-inch table for sorting. We sort by species, gender, weight, and other collectable characteristics requested by the lead biologist. We now have the specifics of the truck, and the Pollock for that matter, based on circumstantial and physical evidence. Sounds a bit like CSI doesn't it? A sample of less than four hundred fish is desired to make the data collection a success. Often we get more. The sorted data is entered in the computer and the information is combined with the cumulative data of the survey to demonstrate trends and density results for the Walleye Pollock.

Personal Log

The MILLER FREEMAN doesn't turn off the engine. This diesel-powered ship runs all the time! As we transect the grid course day in and day out, the boat maintains a rate of about 12 knots. The only time it slows is during trawl operations. Trawling occurs when the chief scientist feels it would be good to get a sample of what she sees on the four sonar frequencies. The result to your ears is comparable to a commercial jet airliner from inside the coach. I'd say the crew is totally used to it. It actually seems to help me sleep!

I have participated in four Pollock hauls now. They have all been successes! It takes about two, to two and a half hours to conduct the scientific processing of a catch. It is pretty slimy business!

Did You Know?

British Scientists are researching the slime found on fish to develop a drug that would defend the body against diseases. The hope is to replicate the protection properties that fish provide to trout on our bodies. Could you imagine your roll on slime dispenser? I'm sure that's not what they have in mind!